

IN THE CLAIMS:

Claim 1 (currently amended) An optical device for producing a polarisation rotation of an input optical signal received by the device along a first transmission path in a forward direction, the device comprising:

a single birefringent element for, in use, splitting the input optical signal into two orthogonal polarisation component signals;

a polarisation rotating means for, in use, rotating each polarisation component signal by a predetermined amount, and

a reflective optical circuit means ~~wherein the device is arranged in a manner such that, in use, such that the two rotated polarisation component signals are re-combined by way of said birefringent element to form an output optical signal for transmission in a reverse direction along the first transmission path for providing the predetermined polarisation-rotated optical signal.~~

Claim 2 (original) An optical device as claimed in claim 1 wherein said polarisation rotation is by 90 degrees.

Claim 3 (currently amended) An optical device as claimed in claim 1 wherein the polarisation rotating means comprises a nominally 45° Faraday rotator and wherein the an optical circuit means is arranged in a manner such that, in use, the polarisation component signals are being transmitted twice through the nominally 45° Faraday rotator.

Claim 4 (currently amended) An optical device as claimed in claim 3 wherein the optical

circuit means comprises a lens and a reflective element.

Claim 5 (previously presented) An optical device as claimed in claim 1 wherein the birefringent element comprises rutile.

Claim 6 (cancelled)

Claim 7 (currently amended) A method for producing a predetermined polarisation ~~rotations~~ rotation of an a received optical signal propagating in a forward direction along a first transmission path, the method comprising the steps of:

(a) splitting the received optical signal into two orthogonal polarisation component signals utilising a single birefringent element;

(b) rotating each polarisation component signal by nominally predetermined polarisation rotation utilising a polarisation rotation means; and

(c) redirecting each polarisation component through the single birefringent element to thereby combining combine the two rotated polarisation component signals utilising the birefringent element to form a transmitted optical signal propagating in a reverse direction along the first transmission path.

Claim 8 (original) A method as claimed in claim 7 wherein said predetermined polarisation rotation comprises a 90 degree polarisation.

Claim 9 (previously presented) A method as claimed in claim 7 wherein said rotating step comprises: rotating each polarisation component signal utilising a nominally 45° Faraday

rotator and an optical circuit arranged in a manner such that, in use, the polarisation component signals are being transmitted twice through the nominally 45° Faraday rotator.

Claim 10 (original) A method as claimed in claim 9 wherein said optical circuit comprises a lens and a reflective element.

Claim 11 (previously presented) A method as claimed in claim 7 wherein the birefringent element comprises rutile.

Claim 12 (original) A method as claimed in claim 7 wherein said method further comprises the steps of coupling the optical signal into the device from an optical fibre, and coupling the rotated optical signal back into the optical fibre.

Claim 13 (currently amended) An optical telecommunications system including an optical device for producing a polarisation rotation of an input optical signal received ~~transmitted~~ by said system in a forward direction along a first transmission path, the device comprising: a single birefringent element for, in use, splitting the optical signal into two orthogonal polarisation component signals; a polarisation rotating means for, in use, rotating each polarisation component signal by a predetermined amount, a reflective optical circuit means arranged, in use, such that the two rotated polarisation component signals are re-combined by the single birefringent element to form an output signal having the predetermined polarisation rotation for transmission along the first transmission path in a reverse direction. ~~and wherein the device is arranged in a manner such that, in use, the two rotated polarisation component signals are being combined by way of the~~

~~birefringent element for providing the predetermined polarisation rotated optical signal.~~

Claim 14 (previously presented) The optical device as claimed in claim 1, wherein the optical device comprises an optical circuit comprising a first path wherein the two orthogonal component signals are transmitted in a first direction and a return path wherein the two orthogonal component signals are transmitted in an opposite direction, the optical circuit consisting of the single birefringent element, the polarization rotating means and other components, including a lens and a reflective element, the single birefringent element and other components having fit} an affect on a relative displacement of the two orthogonal polarization component signals with respect to one another that is the same in the first and opposite directions at any point along the first and return paths.

Claim 15 (previously presented) The optical device as claimed in claim 1, wherein the optical device comprises an optical circuit comprising the single birefringent element, the polarization rotating means and a reflective element, the two orthogonal polarization component signals being transmitted from the polarization rotating means to the reflective element in a first direction and back to the polarization rotating means in an opposite direction, with a relative displacement of the two orthogonal component signals without being displaced with respect to one another in the first direction being the same as a relative displacement of the two orthogonal component signals in the opposite direction.

Claim 16 (previously presented) The method as claimed in claim 7, wherein the two orthogonal polarization component signals are transmitted from the polarization rotating means to a reflective element in a first direction and back to the polarization rotating

means in an opposite direction with a relative displacement of the two orthogonal component signals without being displaced with respect to one another being the same in the first and opposite directions.

Claim 17 (previously presented) The optical telecommunications system as claimed in claim 13, wherein the optical device comprises an optical circuit comprising a first path wherein the two orthogonal component signals are transmitted in a first direction and a return path wherein the two orthogonal component signals are transmitted in an opposite direction. the optical circuit consisting of the single birefringent element, the polarization rotating means and other components, including a lens and a reflective element, the single birefringent element and other components having an affect on a relative displacement of the two orthogonal polarization component signals with respect to one another that is the same in the first and opposite directions at any point along the first and return paths.

Claim 18 (previously presented) The optical telecommunications system as claimed in claim 13, wherein the optical device comprises an optical circuit comprising the single birefringent element, the polarization rotating means and a reflective element, the two orthogonal polarization component signals being transmitted from the polarization rotating means to the reflective element in a first direction and back to the polarization rotating means in an opposite direction. with a relative displacement of the two orthogonal component signals without being displaced with respect to one another being the same in the first and opposite directions.

Claim 19 (currently amended) An optical device for producing a polarisation rotation of

an optical signal, the device comprising: a single birefringent element for, in use, splitting the optical signal into two orthogonal polarisation component signals; a polarisation rotating means for, in use, rotating each polarisation component signal by a predetermined amount, and wherein the device is arranged in a manner such that, in use, the two ~~rotated~~ polarisation component signals follow substantially the same paths in opposite directions as the orthogonal polarisation component signals through the polarisation rotating means and are combined by way of said birefringent element ~~for providing to produce~~ the predetermined polarisation rotated optical signal.

Claim 20 (previously presented) An optical device as claimed in claim 3, wherein the optical circuit comprises a lens and a reflective element for reflecting said polarisation component signals for transmission back through the 45° Faraday rotator.

Claim 21 (currently amended) A method for producing a predetermined polarisation rotations of an optical signal, the method comprising the steps of:

(a) splitting the optical signal into two orthogonal polarisation component signals utilising a single birefringent element;

(b) rotating each polarisation component signal by nominally predetermined polarisation rotation utilising a polarisation rotation means; and

(c) redirecting each polarisation component through the a single birefringent element to combining recombine the two polarisation component signals rotated in step (b) into a polarisation rotated optical signal utilising the birefringent element, wherein in step (a) the optical signal is transmitted to and enters the single birefringent element along a first path and in step (c) the polarization rotated optical signal exits the single

birefringent element along substantially the same first path.

Claim 22 (currently amended) An optical telecommunications system including an optical device for producing a polarisation rotation of an input optical signal to generate an output optical signal transmitted by said system, the device comprising:

a single birefringent element for, in use, splitting the input optical signal into two orthogonal polarisation component signals;

a polarisation rotating means for, in use, rotating each polarisation component signal by a predetermined amount, and wherein the device is arranged in a manner such that, in use, the two rotated polarisation component signals are combined by way of the birefringent element to form the output optical signal having ~~for providing the~~ predetermined polarisation rotation ~~rotated optical signal~~, said ~~polarisation rotated optical signal~~ output signal being transmitted back into said system along the same path as said input optical signal.